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Analgesia by wound infiltration after surgical excision of benign breast lumps

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Summary

Wound infiltration with bupivacaine provided complete postoperative pain relief in 14 of 19 women undergoing excision biopsy of a benign breast lump under general anaesthesia. Fifteen patients formed a control group in whom the wound was infiltrated with saline. They had inadequate relief of pain despite receiving significantly more opioid analgesia than the bupivacaine group in the postoperative period. The analgesia from bupivacaine usually outlasted the postoperative pain. No adverse reactions were apparent.

Introduction

Significant pain may follow minor surgery and, although local anaesthetic-induced neural blockade is the most effective method of providing pain relief following the procedure *(1)*, analgesia is usually provided by the intermittent intramuscular administration of an opioid. Whilst regional techniques are not practicable for much minor surgery local application of a local anaesthetic agent can be successful in relieving pain. A decrease in opioid consumption after surgery has been demonstrated following the perfusion of surgical wounds with bupivacaine 0.5% *(2,3,4)*, with no apparent effect on wound healing. Chetty and colleagues *(5)* compared a general anaesthetic technique with local anaesthesia (1% lignocaine) for excision biopsy of breast lumps and found no difference between the two groups in the pain experienced after surgery. However, the postoperative medication was not reported for either group and retrospective pain scores were collected at the follow-up out-patient clinic 7–10 days later. Wound infiltration with bupivacaine has been used after general anaesthesia to provide analgesia. When used after cholecystectomy both opioid consumption and pulmonary complications were reduced *(6)*.

This study was undertaken to assess the use of intra-incisional bupivacaine to relieve pain after minor breast surgery.

Patients and methods

This prospective study was approved by the Hospital Ethical Committee and written informed consent was obtained from 34 healthy women aged between 16 and 60 years undergoing excision biopsy of a single benign breast lump. The patients were allocated randomly to receive 10 ml of either bupivacaine 0.5% or physiological saline into the wound at the end of surgery. The test solutions were prepared in coded ampoules in the sterile unit of the Western Infirmary Pharmacy. Both administration and assessment were conducted double-blind.

Anaesthetic technique: A standardised anaesthetic technique was used throughout. Premedication consisted of temazepam 20 mg orally 45 to 75 minutes before surgery. Anaesthesia was induced with thiopentone and maintained with halothane 1–2% and nitrous oxide 67% in oxygen. Breathing was spontaneous through a Magill breathing system.

Surgical technique: After removal of the breast lump and when haemostasis had been secured, the wound was infiltrated with 10 ml of test solution. Five to six ml were infiltrated into the base of the wound and the remainder injected along both skin edges. When a wound drain was used it was brought out through the wound.

Following the operation the patients were transferred to the recovery area. Morphine 10 mg (Cyclimorph 10) by intramuscular injection and paracetamol 1 g by mouth were prescribed for all patients. One of these two drugs was to be given for pain at the discretion of either the recovery or the general ward nursing staff. This is the usual ward practice after surgery.

One half to one hour later the patients were interviewed by one of the authors and a subjective pain score obtained on a four point ordered categories scale (no pain = 0; mild pain = 1; moderate pain = 2; severe pain = 3). The patients were then transferred to the post-surgical ward, and over the next 24 hours the analgesic drugs were administered by the nursing staff as they thought necessary (usually morphine for moderate or severe pain and paracetamol for milder pain). Twenty-two to twenty-six hours after surgery, pain scores, analgesic consumption and the presence of any complication, such as nausea or vomiting, were recorded. All wounds were examined 3 weeks later.

Comparison of pain scores in the two groups was undertaken using an unpaired Mann–Whitney test, while in the comparison of analgesic requirements a Fisher exact test was used.

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Results

Of the 34 patients included in the study 19 had wounds infiltrated with bupivacaine and 15 with saline. The two groups were similar in terms of age, averaging 35.1 (S.D. = 13.3) for the bupivacaine group and 31.6 (S.D. = 12.9) for the saline group.

At one hour the bupivacaine group had much less pain than the saline group on the ordered categories scale (Table I) and the improved analgesia was maintained over the first 24 hours into the postoperative period (Table II). The differences in pain relief were significant.

The administration of analgesic drugs to the bupivacaine group was significantly less than to the saline group (Table III). Three of the 11 patients in the saline group given morphine received more than one dose. When the numbers of patients given any analgesic was compared (Table III) a significant effect is still apparent although the difference is less marked. Wound healing was considered normal in all patients.

Discussion

Bupivacaine infiltration reduced both pain and analgesic requirements after breast biopsy. The pain that follows minor surgery is different from that following major surgery more in duration than in initial intensity *(7)*. Thus the contribution that infiltration of local anaesthetic can make to analgesia after surgery will be most significant after minor surgery. The local analgesia from a single application of a local anaesthetic agent may persist for longer than the pain of minor surgery and wound perfusion is unnecessary. This makes the technique simple and widely applicable.

Excision biopsy of benign breast lumps was chosen as our model because surgery and anaesthesia could be standardised readily. The infiltration of physiological saline was used to control the study. Although this has been reported to reduce postoperative pain *(3,8)*, in the present study it was significantly less effective than bupivacaine. Analgesia was prescribed to be given 'as required' by the ward nursing staff. However, as is common in studies on postoperative analgesia this regimen did not provide effective analgesia after a minor operation. Since the analgesics prescribed are rationed by the nursing staff their use is a poor assessment of postoperative pain, but the patients' own pain scores more accurately reflect pain control. The large reduction in opioid administration in the bupivacaine group should allow early ambulation and decrease the incidence of nausea or vomiting after surgery *(9)*. In marked contrast to the study reported by Chetty *et al. (4)* only one patient in our study experienced nausea.

Local anaesthesia with lignocaine has been used for breast lump biopsy. In one study *(10)*, 60% of patients found this procedure was unpleasant and over 50% would want general anaesthsia for a repeat biopsy. In another study *(4)*, 35% of patients experienced pain or discomfort perioperatively. To reduce postoperative pain we suggest bupivacaine as a superior local anaesthetic. We conclude that wound infiltration with bupivacaine is a simple, safe adjunct in providing effective analgesia after this minor surgical procedure carried out under general anaesthesia.

TABLE I *Pain scores collected in an ordered categories scale up to one hour after operation*

	Pain scores			
	0 (absent)	1 (mild)	2 (moderate)	3 (severe)
Bupivacaine group	12	7	0	0
Saline group	1	7	4	3

P = 0.0001 (unpaired Mann–Whitney test).

TABLE II *Overall pain scores collected 24 hours after operation*

	Pain scores		
	0 (absent)	1 (mild)	2 (moderate)
Bupivacaine group	14	5	0
Saline group	5	7	3

P = 0.01 (unpaired Mann–Whitney test).

TABLE III *Analgesic requirements in the first 24 hours after operation*

	Given morphine	*Given any analgesia*
Bupivacaine group *(n = 19)*	2	5
Saline group *(n* = 15)	9	11
P =	0.006	0.016

Fisher exact test.

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